Log Event A

Borehole 30-05-07

Borehole Information

Farm : C	**Tank :** C-105	**Site Number :** 299-E27-118
N-Coord : 42,826	**W-Coord :** 48,353	**TOC Elevation :** 646.00
Water Level, ft :	**Date Drilled :** 7/31/1974	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 70	

Borehole Notes:

This borehole was drilled in July 1974 to a depth of 70 ft using 6-in. casing. The drilling report does not indicate if the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the ground surface.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1996	**Calibration Reference :** GJO-HAN-13	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	01/21/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	67.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	64.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	01/21/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	64.0	**Counting Time, sec.:**	100	**L/R :** R	**Shield :** N
Finish Depth, ft. :	31.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	01/21/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	32.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	14.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

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Log Run Number :	4	**Log Run Date :**	01/22/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	15.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	0.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 07/02/1997

Analysis Notes :

This borehole was logged by the SGLS in four log runs. Excessive dead time (greater than 50 percent) was encountered during log run 1 at a depth of 64.5 ft. As a result, log run 2 was logged in real time from 64 to 31.5 ft. Log runs 3 and 4 (32.5 to 0 ft) were logged in live time after the dead time dropped below 50 percent.

The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Detector saturation occurred from 35.5 to 42 ft and 58 to 59.5 ft; no spectral data were collected along these regions of the borehole. Zones of high dead time (greater than 50 percent) occurred from 34 to 35 ft, 42.5 to 44 ft, 47.5 to 57.5 ft, and 60 to 61 ft. Accurate radioassays could not be determined from the limited spectral data collected within these intervals and, consequently, these data were not included on the log plot.

The man-made radionuclides Cs-137, Co-60, Eu-152, Eu-154, and U-235 were detected in regions of the borehole where detector saturation and high dead time did not occur. Continuous Cs-137 contamination was detected from the ground surface to 33.5 ft, 44.5 to 47 ft, and 61.5 ft to the bottom of the logged interval (67 ft). Co-60 contamination was detected at 28.5 ft and continuously from 65 to 66.5 ft. Eu-152 contamination was detected at the ground surface and 65.5 ft. Eu-154 contamination was detected at 27.5, 32.5, and 65.5 ft. U-235 contamination was detected at the ground surface, 46.5, and 64 ft.

The K-40 and Th-232 concentration values decrease at a depth of about 15 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-105.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest

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concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

An additional log plot compares spectral gamma data collected with the Radionuclide Logging System (RLS) in 1993 with spectral gamma data collected with the SGLS in 1997. Uncertainty bars and MDLs are not included on these plots.